



Fluoridation

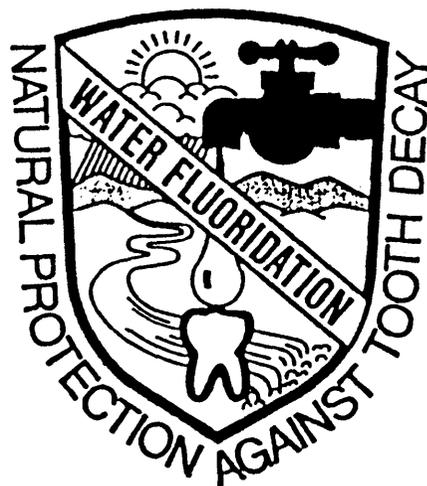
Census

1988 - Summary

CDC

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES/Public Health Service/Centers for Disease Control





FLUORIDATION CENSUS 1988 - SUMMARY

FEBRUARY 1990

**U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service
Centers for Disease Control
Center for Prevention Services
Dental Disease Prevention Activity
Atlanta, Georgia 30333**

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INTRODUCTION

The adjustment of the fluoride content of community water supplies to an optimal level to prevent tooth decay began on January 25, 1945, in Grand Rapids, Michigan. At the present time, over 124 million citizens in more than 7,800 communities throughout the Nation are receiving the benefits of optimally adjusted fluoridated water. An additional 9 million people in 1,846 communities are using water with naturally occurring fluoride at levels of 0.7 parts per million or higher. Therefore, 43 years after the first water system was fluoridated, more than 53 percent of the Nation's population has access to water with a dentally significant concentration of fluoride.

Adjusted fluoridation is the conscious maintenance of the optimal fluoride concentration in the water supply for preventing dental caries. The optimal concentration may be accomplished by adding fluoride chemicals to fluoride deficient water; by blending two or more sources of water naturally containing fluoride to achieve the optimal concentration; or partial defluoridation, that is, removing naturally occurring excessive fluorides to obtain the recommended level. Water systems are considered to have dentally significant natural fluoridation if they contain 0.7 parts per million (ppm) or more of naturally occurring fluoride. Water systems and communities with optimally adjusted fluoride and naturally occurring fluoride in water are listed in this publication. Adjusted water systems are fluoridated at the optimal level according to the average maximum daily air temperature in the community. (Recommended concentrations, according to National Interim Primary Drinking Water Regulations, 1975, are shown on Table A.) Although the term natural fluoridation has no particular scientific or official connotation, it has been used in this publication for the sake of simplification.

TABLE A

Fluoridation Centers, 1947. Division of Dental Health, U.S. Public Health Service

| Annual Average of Maximum Daily Air Temperatures ¹ (°F) | Recommended Fluoride | | Recommended Control Range | | | |
|--|----------------------|------------------------------|---------------------------|--------------|------------|-------------|
| | Community (ppm) | School ² (ppm) | 0.1 Below | 0.5 Above | 20% Low | 20% High |
| 40.0 - 53.7 | 1.2 | 5.4 | 1.1 | 1.7 | 4.3 | 6.5 |
| 53.8 - 58.3 | 1.1 | 5.0 | 1.0 | 1.6 | 4.0 | 6.0 |
| 58.4 - 63.8 | 1.0 | 4.5 | 0.9 | 1.5 | 3.6 | 5.4 |
| 63.9 - 70.6 | 0.9 | 4.1 | 0.8 | 1.4 | 3.3 | 4.9 |
| 70.7 - 79.2 | 0.8 | 3.6 | 0.7 | 1.3 | 2.9 | 4.3 |
| 79.3 - 90.5 | 0.7 | 3.2 | 0.6 | 1.2 | 2.6 | 3.8 |

¹Based on temperature data obtained for a minimum of five years.

²Based on 4.5 times the optimum fluoride level for communities.

Source: Centers for Disease Control, Center for Prevention Services,
Dental Disease Prevention Activity.

METHODOLOGY

A computer printout of the fluoridation status for each State as it was collected for the 1985 Fluoridation Census was forwarded to every State health department as a guide to updating information for the Fluoridation Census 1988 Summary. They were requested to update, change, and verify the information presented and to include new fluoridation installations while deleting those that were inappropriate. A request was made to update the population figures to reflect 1988 census estimates. This information was then submitted for the Fluoridation Census 1988: States were asked to report each fluoridated water system and the communities each system served; the status of fluoridation, adjusted, consecutive, or natural; the system from which water was purchased, if consecutive; the population receiving fluoridated water; the date on which fluoridation started; and the chemical used for fluoridation, if adjusted.

The updated information was returned to CDC where a master file was created to incorporate the new format and to reflect changes made in the previous data provided by State health officials. The States were informed that unless they made specific changes in their State's printout, the data on the existing printout would be used in the publication of the Fluoridation Census 1988 Summary. In essence, this publication is a report of the Status of Fluoridation made by the States, and the data herewith reported has been provided by the individual States.

Previous Status Reports were:

Fluoridation Census, 1967, Division of Dental Health, National Institutes of Health, U.S. Department of Health, Education, and Welfare. U.S. Government Printing Office Publication #1968 0-310-023.

Fluoridation Census, 1969, Division of Dental Health, National Institutes of Health, U.S. Department of Health, Education, and Welfare. Natural Fluoride Content of Community Water Supplies, Division of Dental Health, NIH, DHEW. U.S. Government Printing Office Publication #1970 0-380-791.

Fluoridation Census, 1975, Dental Disease Prevention Activity, Bureau of State Services, Center for Disease Control, Public Health Service, U.S. Department of Health, Education, and Welfare. U.S. Government Printing Office Publication # 1977 - 740-116/3782, Region No. 4.

Fluoridation Census, 1980, Dental Disease Prevention Activity, Bureau of State Services, Centers for Disease Control, Public Health Service, U.S. Department of Health and Human Services. U.S. Government Printing Office Publication #1984 - 751-641, Region No. 4.

Fluoridation Census, 1985, Dental Disease Prevention Activity, Bureau of State Services, Centers for Disease Control, Public Health Service, U.S. Department of Health and Human Services. U.S. Government Printing Office Publication # 1988 - 535-439.



SUMMARY OF FLUORIDATION STATISTICS

TABLE 1
POPULATION AND PERCENT SERVED WITH ADJUSTED AND NATURAL FLUORIDATED
WATER BY REGION AND STATE AS OF DECEMBER 31, 1988

| | TOTAL POPULATION* | POPULATION SERVED BY PUBLIC WATER SUPPLY** | POPULATION SERVED FLUORIDATED WATER | % PUBLIC WATER SUPPLY POPULATION DRINKING FLUORIDATED WATER | RANK |
|----------------------|----------------------|--|--|---|------|
| UNITED STATES | 249,008,500 | 218,924,000 | 132,422,064 | 60.5 | |
| REGION I | 12,962,000 | 11,494,000 | 8,583,688 | 74.7 | |
| CONNECTICUT | 3,233,000 | 2,727,000 | 2,365,309 | 86.7 | 13 |
| MAINE | 1,205,000 | 819,000 | 394,440 | 48.7 | 38 |
| MASSACHUSETTS | 5,889,000 | 5,865,000 | 4,734,293 | 80.7 | 18 |
| NEW HAMPSHIRE | 1,085,000 | 698,000 | 147,367 | 21.1 | 46 |
| RHODE ISLAND | 993,000 | 963,000 | 712,551 | 74.0 | 21 |
| VERMONT | 557,000 | 422,000 | 229,728 | 54.4 | 34 |
| REGION II | 28,918,500 | 28,476,000 | 15,336,744 | 53.9 | |
| NEW JERSEY | 7,721,000 | 7,721,000 | 1,170,047 | 15.2 | 49 |
| NEW YORK | 17,909,000 | 16,723,000 | 11,645,385 | 69.6 | 23 |
| PUERTO RICO+ | 3,288,500 | 4,032,000 | 2,521,312 | 62.5 | 30 |
| REGION III | 25,794,000 | 21,563,000 | 14,709,133 | 68.2 | |
| DELAWARE | 660,000 | 625,000 | 440,531 | 70.5 | 22 |
| DISTRICT OF COLUMBIA | 617,000 | 617,000 | 617,000 | 100.0 | 1 |
| MARYLAND | 4,625,000 | 3,591,000 | 3,438,289 | 95.7 | 6 |
| PENNSYLVANIA | 12,001,000 | 10,138,000 | 5,298,856 | 52.3 | 35 |
| VIRGINIA | 6,015,000 | 4,913,000 | 3,763,427 | 76.6 | 20 |
| WEST VIRGINIA | 1,876,000 | 1,679,000 | 1,151,030 | 68.6 | 26 |
| REGION IV | 43,890,000 | 36,952,000 | 24,745,781 | 67.0 | |
| ALABAMA | 4,012,000 | 3,767,000 | 2,425,520 | 64.4 | 28 |
| FLORIDA | 12,335,000 | 11,638,000 | 5,400,288 | 46.4 | 39 |
| GEORGIA | 6,342,000 | 4,907,000 | 4,691,511 | 95.6 | 7 |
| KENTUCKY | 3,727,000 | 2,967,000 | 2,469,850 | 83.2 | 16 |
| MISSISSIPPI | 2,620,000 | 2,376,000 | 1,170,212 | 49.3 | 36 |
| NORTH CAROLINA | 6,489,000 | 4,540,000 | 3,045,571 | 67.1 | 27 |
| SOUTH CAROLINA | 3,470,000 | 2,761,000 | 2,423,325 | 87.8 | 12 |
| TENNESSEE | 4,895,000 | 3,996,000 | 3,119,504 | 78.1 | 19 |

*Based on 1988 Bureau of Census estimates

**Federal Reporting Data System PWS service populations exceeded the Bureau of Census estimates for DC, HI, NV, NJ, UT, and TX.

+ Data for these States based on Fluoridated

TABLE 1 (CONTINUED)
POPULATION AND PERCENT SERVED WITH ADJUSTED AND NATURAL FLUORIDATED
WATER BY REGION AND STATE AS OF DECEMBER 31, 1988

| | TOTAL POPULATION* | POPULATION SERVED BY PUBLIC WATER SUPPLY* | POPULATION SERVED FLUORIDATED WATER | % PUBLIC WATER SUPPLY POPULATION DRINKING FLUORIDATED WATER | RANK |
|----------------------|----------------------|---|--|---|------|
| UNITED STATES | 249,008,500 | 218,924,000 | 132,422,064 | 60.5 | |
| REGION V | 46,427,000 | 37,303,000 | 34,188,107 | 91.6 | |
| ILLINOIS | 11,614,000 | 10,504,000 | 10,504,000 | 100.0 | 1 |
| INDIANA | 5,556,000 | 3,761,000 | 3,642,857 | 96.9 | 3 |
| MICHIGAN | 9,240,000 | 6,835,000 | 6,213,483 | 90.9 | 9 |
| MINNESOTA | 4,307,000 | 3,686,000 | 2,998,922 | 81.4 | 17 |
| OHIO | 10,855,000 | 9,215,000 | 7,901,092 | 85.7 | 14 |
| WISCONSIN | 4,855,000 | 2,302,000 | 2,927,753 | 88.7 | 10 |
| REGION VI | 28,393,000 | 26,862,000 | 15,549,806 | 57.9 | |
| ARKANSAS | 2,395,000 | 2,003,000 | 1,191,817 | 59.5 | 31 |
| LOUISIANA+ | 4,408,000 | 4,061,000 | 1,978,703 | 48.7 | 37 |
| NEW MEXICO | 1,507,000 | 1,244,000 | 788,087 | 63.4 | 29 |
| OKLAHOMA | 3,242,000 | 2,713,000 | 1,576,681 | 58.1 | 33 |
| TEXAS | 16,841,000 | 16,841,000 | 10,014,518 | 59.5 | 31 |
| REGION VII | 12,072,000 | 10,362,000 | 6,823,720 | 65.9 | |
| IOWA | 2,834,000 | 2,311,000 | 1,976,631 | 85.5 | 15 |
| KANSAS | 2,495,000 | 2,472,000 | 991,123 | 40.1 | 41 |
| MISSOURI | 5,141,000 | 4,473,000 | 3,097,162 | 69.2 | 24 |
| NEBRASKA | 1,602,000 | 1,106,000 | 758,804 | 68.6 | 25 |

*Based on 1988 Bureau of Census estimates

**Federal Reporting Data System PWS service populations exceeded the Bureau of Census estimates for DC, HI, NV, NJ, UT, and TX.

+ Data for these States based on Fluoridation Census 1985 data.

TABLE 1 (CONTINUED)
POPULATION AND PERCENT SERVED WITH ADJUSTED AND NATURAL FLUORIDATED
WATER BY REGION AND STATE AS OF DECEMBER 31, 1988

| | TOTAL POPULATION* | POPULATION SERVED BY PUBLIC WATER SUPPLY** | POPULATION SERVED FLUORIDATED WATER | % PUBLIC WATER SUPPLY POPULATION DRINKING FLUORIDATED WATER | RANK |
|----------------------|----------------------|--|--|---|------|
| UNITED STATES | 249,008,500 | 218,924,000 | 132,422,064 | 60.5 | |
| REGION VIII | 7,655,000 | 6,997,000 | 4,359,137 | 62.3 | |
| COLORADO | 3,301,000 | 3,270,000 | 3,009,423 | 92.0 | 8 |
| MONTANA+ | 805,000 | 579,000 | 164,090 | 28.3 | 44 |
| NORTH DAKOTA | 667,000 | 513,000 | 496,045 | 96.7 | 4 |
| SOUTH DAKOTA | 713,000 | 552,000 | 532,532 | 96.5 | 5 |
| UTAH | 1,690,000 | 1,690,000 | 30,730 | 1.8 | 52 |
| WYOMING | 479,000 | 393,000 | 126,317 | 32.1 | 43 |
| REGION IX | 33,955,000 | 31,679,000 | 4,920,605 | 15.5 | |
| ARIZONA | 3,489,000 | 3,093,000 | 613,646 | 19.8 | 47 |
| CALIFORNIA+ | 28,314,000 | 26,643,000 | 4,140,978 | 15.7 | 48 |
| HAWAII | 1,098,000 | 1,098,000 | 142,570 | 13.0 | 50 |
| NEVADA | 1,054,000 | 1,054,000 | 23,411 | 2.2 | 51 |
| REGION X | 8,942,000 | 7,042,000 | 2,620,895 | 37.2 | |
| ALASKA | 524,000 | 361,000 | 318,591 | 88.3 | 11 |
| IDAHO+ | 1,003,000 | 709,000 | 234,207 | 33.0 | 42 |
| OREGON | 2,767,000 | 2,125,000 | 505,995 | 23.8 | 45 |
| WASHINGTON | 4,648,000 | 3,847,000 | 1,562,102 | 40.6 | 40 |

*Based on 1988 Bureau of Census estimates

**Federal Reporting Data System PWS service populations exceeded the Bureau of Census estimates for DC, HI, NV, NJ, UT, and TX.

+ Data for these States based on Fluoridation Census 1985 data.

TABLE II
NUMBER OF PUBLIC WATER SYSTEMS, COMMUNITIES, AND POPULATIONS USING
ADJUSTED AND NATURAL FLUORIDATION BY REGION AS OF DECEMBER 31, 1988

| | ADJUSTED | | | NATURAL | | |
|----------------------|--------------|--------------|--------------------|-------------|-------------|------------------|
| | SYSTEMS* | COMMUNITIES | POPULATION | SYSTEMS* | COMMUNITIES | POPULATION |
| UNITED STATES | 8874 | 7867 | 124,153,775 | 3389 | 1847 | 8,812,234 |
| REGION I | 247 | 337 | 8,571,461 | 71 | 3 | 12,227 |
| CONNECTICUT | 37 | 88 | 2,364,279 | 4 | 1 | 1,030 |
| MAINE | 61 | 89 | 394,440 | 0 | 0 | 0 |
| MASSACHUSETTS | 68 | 100 | 4,733,896 | 3 | 0 | 397 |
| NEW HAMPSHIRE | 11 | 9 | 136,567 | 64 | 2 | 10,800 |
| RHODE ISLAND | 13 | 21 | 712,551 | 0 | 0 | 0 |
| VERMONT | 57 | 30 | 229,728 | 0 | 0 | 0 |
| REGION II | 685 | 676 | 15,221,683 | 17 | 22 | 115,061 |
| NEW JERSEY | 28 | 66 | 1,056,302 | 15 | 20 | 113,745 |
| NEW YORK | 618 | 568 | 11,644,069 | 2 | 2 | 1316 |
| PUERTO RICO | 39 | 42 | 2,521,312 | 0 | 0 | 0 |
| REGION III | 499 | 898 | 14,709,008 | 267 | 87 | 267,125 |
| DELAWARE | 9 | 11 | 433,800 | 5 | 3 | 6,731 |
| DISTRICT OF COLUMBIA | 1 | 1 | 884,000 | 0 | 0 | 0 |
| MARYLAND | 100 | 97 | 3,389,676 | 54 | 34 | 48,613 |
| PENNSYLVANIA | 140 | 494 | 5,298,856 | 0 | 0 | 0 |
| VIRGINIA | 121 | 158 | 3,551,646 | 208 | 50 | 211,781 |
| WEST VIRGINIA | 128 | 137 | 1,151,030 | 0 | 0 | 0 |
| REGION IV | 1,693 | 1,284 | 23,384,815 | 253 | 86 | 1,382,315 |
| ALABAMA | 233 | 165 | 2,374,083 | 25 | 18 | 51,437 |
| FLORIDA | 76 | 111 | 4,581,277 | 23 | 26 | 819,001 |
| GEORGIA | 284 | 252 | 4,675,471 | 5 | 4 | 16,040 |
| KENTUCKY | 316 | 225 | 2,491,199 | 0 | 0 | 0 |
| MISSISSIPPI | 193 | 113 | 1,092,121 | 35 | 11 | 77,091 |
| NORTH CAROLINA | 232 | 141 | 2,937,490 | 31 | 25 | 108,081 |
| SOUTH CAROLINA | 170 | 42 | 2,112,670 | 134 | 2 | 310,655 |
| TENNESSEE | 189 | 235 | 3,119,504 | 0 | 0 | 0 |

*Note: System refers to fluoridating systems plus consecutive systems.

TABLE II (CONTINUED)
NUMBER OF PUBLIC WATER SYSTEMS, COMMUNITIES, AND POPULATIONS USING
ADJUSTED AND NATURAL FLUORIDATION BY REGION AS OF DECEMBER 31, 1988

| | ADJUSTED | | | NATURAL | | |
|----------------------|--------------|--------------|--------------------|-------------|-------------|------------------|
| | SYSTEMS* | COMMUNITIES | POPULATION | SYSTEMS* | COMMUNITIES | POPULATION |
| UNITED STATES | 8874 | 7867 | 124,153,775 | 3389 | 1847 | 8,812,234 |
| REGION V | 3,452 | 2,789 | 33,247,240 | 881 | 532 | 1,516,815 |
| ILLINOIS | 1,341 | 976 | 10,350,632 | 210 | 148 | 729,316 |
| INDIANA | 419 | 298 | 3,396,417 | 92 | 78 | 246,440 |
| MICHIGAN | 351 | 240 | 6,090,702 | 94 | 52 | 122,781 |
| MINNESOTA | 653 | 641 | 2,994,810 | 14 | 12 | 4,112 |
| OHIO | 368 | 371 | 7,663,469 | 319 | 118 | 237,623 |
| WISCONSIN | 320 | 263 | 2,751,210 | 152 | 124 | 176,543 |
| REGION VI | 673 | 473 | 12,400,534 | 783 | 402 | 3,150,772 |
| ARKANSAS | 168 | 113 | 1,180,462 | 13 | 7 | 12,855 |
| LOUISIANA | 51 | 73 | 1,744,824 | 95 | 33 | 233,879 |
| NEW MEXICO | 50 | 18 | 542,474 | 86 | 41 | 245,613 |
| OKLAHOMA | 158 | 93 | 1,467,529 | 55 | 36 | 109,152 |
| TEXAS | 246 | 176 | 7,465,245 | 534 | 285 | 2,549,273 |
| REGION VII | 654 | 693 | 6,177,997 | 399 | 331 | 645,723 |
| IOWA | 295 | 303 | 1,670,339 | 216 | 174 | 306,292 |
| KANSAS | 108 | 128 | 836,690 | 84 | 77 | 154,433 |
| MISSOURI | 203 | 208 | 2,932,091 | 84 | 65 | 165,071 |
| NEBRASKA | 48 | 54 | 738,877 | 15 | 15 | 19,927 |

*Note: System refers to fluoridating systems plus consecutive systems.

TABLE II (CONTINUED)
NUMBER OF PUBLIC WATER SYSTEMS, COMMUNITIES, AND POPULATIONS USING
ADJUSTED AND NATURAL FLUORIDATION BY REGION AS OF DECEMBER 31, 1988

| | ADJUSTED | | | NATURAL | | |
|----------------------|-------------|-------------|--------------------|-------------|-------------|------------------|
| | SYSTEMS* | COMMUNITIES | POPULATION | SYSTEMS* | COMMUNITIES | POPULATION |
| UNITED STATES | 8874 | 7867 | 124,153,775 | 3389 | 1847 | 8,812,234 |
| REGION VIII | 519 | 409 | 3,617,696 | 522 | 270 | 1,004,037 |
| COLORADO | 141 | 55 | 2,462,844 | 288 | 105 | 809,175 |
| MONTANA | 25 | 9 | 60,375 | 64 | 28 | 103,715 |
| NORTH DAKOTA | 121 | 132 | 470,650 | 75 | 61 | 25,395 |
| SOUTH DAKOTA | 215 | 201 | 494,508 | 65 | 57 | 38,024 |
| UTAH | 9 | 3 | 24,490 | 18 | 8 | 6,240 |
| WYOMING | 8 | 9 | 104,829 | 12 | 11 | 21,488 |
| REGION IX | 141 | 94 | 4,489,360 | 121 | 48 | 431,245 |
| ARIZONA | 66 | 6 | 203,983 | 104 | 44 | 409,663 |
| CALIFORNIA | 55 | 82 | 4,140,878 | 1 | 0 | 100 |
| HAWAII | 10 | 3 | 142,570 | 0 | 0 | 0 |
| NEVADA | 10 | 3 | 1,929 | 16 | 4 | 21,482 |
| REGION X | 311 | 214 | 2,333,981 | 75 | 66 | 286,914 |
| ALASKA | 190 | 135 | 318,591 | 0 | 0 | 0 |
| IDAHO | 8 | 4 | 48,842 | 40 | 34 | 185,365 |
| OREGON | 32 | 27 | 464,295 | 20 | 20 | 41,700 |
| WASHINGTON | 81 | 48 | 1,502,253 | 15 | 12 | 59,849 |

*Note: System refers to fluoridating systems plus consecutive systems.

TABLE III
 SCHOOL POPULATION AND NUMBER OF SCHOOLS USING ADJUSTED
 AND NATURAL FLUORIDATION BY REGION AND STATE AS OF DECEMBER 31, 1988

| | ADJUSTED* | | NATURAL* | |
|----------------------|----------------|-------------------|--------------|-------------------|
| | POPULATION | NUMBER OF SCHOOLS | POPULATION | NUMBER OF SCHOOLS |
| UNITED STATES | 121,223 | 360 | 8,824 | 12 |
| REGION I | 5,324 | 20 | 0 | 0 |
| VERMONT | 5,324 | 20 | 0 | 0 |
| REGION III | 3,020 | 5 | 0 | 0 |
| VIRGINIA | 3,020 | 5 | 0 | 0 |
| REGION IV | 68,453 | 203 | 0 | 0 |
| KENTUCKY | 29,989 | 99 | 0 | 0 |
| NORTH CAROLINA | 38,014 | 103 | 0 | 0 |
| SOUTH CAROLINA | 450 | 1 | 0 | 0 |
| REGION V | 42,362 | 124 | 6,719 | 2 |
| INDIANA | 35,101 | 81 | 0 | 0 |
| WISCONSIN | 7,261 | 43 | 6,719 | 2 |
| REGION VI | 1,410 | 2 | 1,045 | 6 |
| NEW MEXICO | 1,410 | 2 | 1,045 | 6 |
| REGION VII | 0 | 0 | 400 | 1 |
| MISSOURI | 0 | 0 | 400 | 1 |
| REGION IX | 170 | 1 | 660 | 3 |
| ARIZONA | 170 | 1 | 660 | 3 |
| REGION X | 484 | 5 | 0 | 0 |
| ALASKA | 484 | 5 | 0 | 0 |

*Schools are fluoridated at 4.5 times the recommended optimal levels for communities.

Note: schools include all American Indian and Alaskan Native Reservation Schools

TABLE IV
 POPULATION, NUMBER OF AMERICAN INDIAN AND ALASKAN NATIVE
 RESERVATIONS USING ADJUSTED AND NATURAL FLUORIDATION, BY REGION AND STATE AS OF
 DECEMBER 31, 1988

| | SYSTEMS | | | |
|----------------------|----------------|----------------------|---------------|----------------------|
| | ADJUSTED | | NATURAL | |
| | POPULATION | NUMBER OF SYSTEMS | POPULATION | NUMBER OF SYSTEMS |
| UNITED STATES | 192,504 | 332 | 16,517 | 55 |
| REGION I | 1,225 | 1 | 0 | 0 |
| MAINE | 1,225 | 1 | 0 | 0 |
| REGION IV | 4,139 | 8 | 0 | 1 |
| MISSISSIPPI | 2,378 | 3 | 0 | 0 |
| NORTH CAROLINA | 1,761 | 5 | 0 | 1 |
| REGION V | 8,137 | 11 | 0 | 0 |
| WISCONSIN | 8,137 | 11 | 0 | 0 |
| REGION VI | 29,035 | 26 | 8,978 | 30 |
| NEW MEXICO | 28,495 | 24 | 8,978 | 30 |
| OKLAHOMA | 540 | 2 | 0 | 0 |
| REGION VII | 2,800 | 2 | 0 | 0 |
| NEBRASKA | 2,800 | 2 | 0 | 0 |
| REGION VIII | 36,203 | 69 | 762 | 5 |
| MONTANA | 8,955 | 15 | 362 | 3 |
| NORTH DAKOTA | 12,188 | 13 | 0 | 0 |
| SOUTH DAKOTA | 12,998 | 35 | 0 | 0 |
| UTAH | 989 | 5 | 400 | 2 |
| WYOMING | 1,073 | 1 | 0 | 0 |
| REGION IX | 58,962 | 74 | 6,777 | 19 |
| ARIZONA | 56,813 | 63 | 6,070 | 15 |
| CALIFORNIA | 245 | 2 | 100 | 1 |
| NEVADA | 1,904 | 9 | 607 | 3 |
| REGION X | 52,003 | 141 | 0 | 0 |
| ALASKA | 50,428 | 140 | 0 | 0 |
| OREGON | 1,575 | 1 | 0 | 0 |

TABLE IV (CONTINUED)
 POPULATION, NUMBER OF AMERICAN INDIAN AND ALASKAN NATIVE
 RESERVATIONS USING ADJUSTED AND NATURAL FLUORIDATION, BY REGION AND STATE AS OF
 DECEMBER 31, 1988
 SCHOOLS*

| | ADJUSTED | | NATURAL | |
|----------------------|--------------|-------------------|--------------|-------------------|
| | POPULATION | NUMBER OF SYSTEMS | POPULATION | NUMBER OF SCHOOLS |
| UNITED STATES | 2,064 | 8 | 8,824 | 12 |
| REGION V | 0 | 0 | 6,719 | 2 |
| WISCONSIN | 0 | 0 | 6,719 | 2 |
| REGION VI | 1,410 | 2 | 1,045 | 6 |
| NEW MEXICO | 1,410 | 2 | 1,045 | 6 |
| REGION VII | 0 | 0 | 400 | 1 |
| MISSOURI | 0 | 0 | 400 | 1 |
| REGION IX | 170 | 1 | 660 | 3 |
| ARIZONA | 170 | 1 | 660 | 3 |
| REGION X | 484 | 5 | 0 | 0 |
| ALASKA | 484 | 5 | 0 | 0 |

*Schools are fluoridated at 4.5 times the recommended optimal levels for communities.

TABLE V
RESIDENT POPULATION, NUMBER OF MILITARY INSTALLATIONS USING
ADJUSTED AND NATURAL FLUORIDATION, BY REGION AND STATE, AS OF DECEMBER 31, 1988

| | ADJUSTED | | NATURAL | |
|----------------------|---------------------|---------------|---------------------|---------------|
| | RESIDENT POPULATION | INSTALLATIONS | RESIDENT POPULATION | INSTALLATIONS |
| UNITED STATES | 1,803,543 | 129 | 53,284 | 20 |
| REGION I | 23,325 | 8 | 0 | 0 |
| MAINE | 10,300 | 4 | 0 | 0 |
| MASSACHUSETTS | 13,000 | 3 | 0 | 0 |
| NEW HAMPSHIRE | 25 | 1 | 0 | 0 |
| REGION II | 45,552 | 6 | 0 | 0 |
| NEW JERSEY | 35,952 | 3 | 0 | 0 |
| NEW YORK | 9,600 | 3 | 0 | 0 |
| REGION III | 522,617 | 12 | 2,027 | 2 |
| DELAWARE | 8,900 | 2 | 0 | 0 |
| MARYLAND | 52,003 | 7 | 2,027 | 2 |
| VIRGINIA | 461,714 | 3 | 0 | 0 |
| REGION IV | 543,309 | 39 | 10,790 | 4 |
| ALABAMA | 11,133 | 2 | 0 | 0 |
| FLORIDA | 122,127 | 14 | 2144 | 2 |
| GEORGIA | 86,200 | 6 | 0 | 0 |
| KENTUCKY | 50,000 | 1 | 0 | 0 |
| MISSISSIPPI | 32,497 | 3 | 0 | 0 |
| NORTH CAROLINA | 135,640 | 4 | 5,470 | 1 |
| SOUTH CAROLINA | 44,593 | 6 | 3,176 | 1 |
| TENNESSEE | 61,119 | 3 | 0 | 0 |
| REGION V | 118,895 | 9 | 1,525 | 2 |
| ILLINOIS | 97,695 | 5 | 25 | 1 |
| INDIANA | 1,500 | 1 | 0 | 0 |
| MICHIGAN | 19,700 | 3 | 0 | 0 |
| OHIO | 0 | 0 | 1,500 | 1 |

Changes do not reflect systems discontinuing fluoridation, rather the closing and consolidating of military bases.

TABLE V (CONTINUED)
 RESIDENT POPULATION, NUMBER OF MILITARY INSTALLATIONS USING
 ADJUSTED AND NATURAL FLUORIDATION, BY REGION AND STATE, AS OF DECEMBER 31, 1988

| | ADJUSTED | | NATURAL | |
|----------------------|---------------------|---------------|---------------------|---------------|
| | RESIDENT POPULATION | INSTALLATIONS | RESIDENT POPULATION | INSTALLATIONS |
| UNITED STATES | 1,803,543 | 129 | 53,284 | 20 |
| REGION VI | 181,969 | 22 | 6,630 | 3 |
| ARKANSAS | 14,170 | 2 | 0 | 0 |
| LOUISIANA | 22,100 | 3 | 1,700 | 1 |
| OKLAHOMA | 16,224 | 5 | 0 | 0 |
| TEXAS | 129,475 | 12 | 4,930 | 2 |
| REGION VII | 48,087 | 5 | 4,000 | 1 |
| KANSAS | 16,800 | 3 | 0 | 0 |
| MISSOURI | 22,500 | 1 | 4,000 | 1 |
| NEBRASKA | 8,787 | 1 | 0 | 0 |
| REGION VIII | 77,967 | 5 | 7,602 | 2 |
| MONTANA | 3,000 | 1 | 7,602 | 2 |
| NORTH DAKOTA | 65,686 | 2 | 0 | 0 |
| SOUTH DAKOTA | 5,000 | 1 | 0 | 0 |
| UTAH | 4,281 | 1 | 0 | 0 |
| REGION IX | 142,570 | 10 | 20,710 | 6 |
| ARIZONA | 0 | 0 | 19,200 | 5 |
| HAWAII | 142,570 | 10 | 0 | 0 |
| NEVADA | 0 | 0 | 1,510 | 1 |
| REGION X | 99,252 | 13 | 0 | 0 |
| ALASKA | 35,543 | 9 | 0 | 0 |
| IDAHO | 6,000 | 1 | 0 | 0 |
| WASHINGTON | 57,709 | 3 | 0 | 0 |

Changes do not reflect systems discontinuing fluoridation, rather the closing and consolidating of military bases.

TABLE VI
NUMBER OF PUBLIC WATER SUPPLY SYSTEMS AND POPULATION SERVED BY EACH
OF THE MAJOR CHEMICALS BY REGION AS OF DECEMBER 31, 1988

| | HYDROFLUOSILICIC ACID | | SODIUM SILICOFLUORIDE | | SODIUM FLUORIDE | |
|----------------------|--------------------------|--------------|--------------------------|--------------|--------------------|--------------|
| | POPULATION | #SYSTEMS | POPULATION | #SYSTEMS | POPULATION | #SYSTEMS |
| UNITED STATES | 69,090,692 | 4,653 | 33,679,408 | 1,329 | 10,500,735 | 2,121 |
| REGION I | 6,079,391 | 99 | 1,577,332 | 25 | 867,413 | 117 |
| CONNECTICUT | 1,665,539 | 23 | 559,500 | 5 | 136,740 | 8 |
| MAINE | 217,724 | 33 | 72,500 | 2 | 81,940 | 24 |
| MASSACHUSETTS | 3,908,786 | 22 | 270,980 | 5 | 532,881 | 40 |
| NEW HAMPSHIRE | 87,242 | 4 | 0 | 0 | 48,025 | 5 |
| RHODE ISLAND | 88,199 | 1 | 624,352 | 12 | 0 | 0 |
| VERMONT | 111,901 | 16 | 50,000 | 1 | 67,827 | 40 |
| REGION II | 4,277,502 | 537 | 7,997,836 | 64 | 2,755,872 | 79 |
| NEW JERSEY | 645,005 | 18 | 317,600 | 3 | 80,697 | 6 |
| NEW YORK | 3,632,497 | 519 | 7,680,236 | 61 | 153,863 | 34 |
| PUERTO RICO | 0 | 0 | 0 | 0 | 2,521,312 | 39 |
| REGION III | 10,729,843 | 224 | 1,013,871 | 86 | 1,511,103 | 167 |
| DELAWARE | 0 | 0 | 140,000 | 1 | 46,000 | 5 |
| DISTRICT OF COLUMBIA | 884,000 | 1 | 0 | 0 | 0 | 0 |
| MARYLAND | 3,217,143 | 71 | 130,353 | 7 | 38,950 | 13 |
| PENNSYLVANIA | 4,370,025 | 81 | 513,269 | 28 | 245,742 | 23 |
| VIRGINIA | 1,751,329 | 48 | 898,017 | 34 | 886,959 | 37 |
| WEST VIRGINIA | 507,346 | 23 | 350,232 | 16 | 293,452 | 89 |
| REGION IV | 11,078,253 | 553 | 6,995,109 | 281 | 2,244,777 | 500 |
| ALABAMA | 2,318,679 | 223 | 53,547 | 8 | 0 | 0 |
| FLORIDA | 1,878,883 | 45 | 2,435,033 | 10 | 9,834 | 3 |
| GEORGIA | 2,746,515 | 118 | 911,189 | 43 | 947,767 | 122 |
| KENTUCKY | 0 | 0 | 0 | 0 | 0 | 0 |
| MISSISSIPPI | 20,665 | 7 | 371,140 | 10 | 700,938 | 175 |
| NORTH CAROLINA | 1,717,969 | 72 | 717,759 | 10 | 256,347 | 130 |
| SOUTH CAROLINA | 972,802 | 58 | 932,729 | 86 | 206,839 | 25 |
| TENNESSEE | 1,422,740 | 30 | 1,573,712 | 114 | 123,052 | 45 |

Note: Chemical used was not indicated for all systems, so these data are not consistent with other summary tables.

TABLE VI (CONTINUED)
NUMBER OF PUBLIC WATER SUPPLY SYSTEMS AND POPULATION SERVED BY EACH
OF THE MAJOR CHEMICALS BY REGION AS OF DECEMBER 31, 1988

| | HYDROFLUOSILICIC ACID | | SODIUM SILICOFLUORIDE | | SODIUM FLUORIDE | |
|----------------------|--------------------------|--------------|--------------------------|--------------|--------------------|--------------|
| | POPULATION | #SYSTEMS | POPULATION | #SYSTEMS | POPULATION | #SYSTEMS |
| UNITED STATES | 69,090,692 | 4,653 | 33,679,408 | 1,329 | 10,500,735 | 2,121 |
| REGION V | 22,751,431 | 2,318 | 6,132,544 | 264 | 1,285,997 | 641 |
| ILLINOIS | 9,298,252 | 997 | 629,024 | 84 | 423,356 | 260 |
| INDIANA | 1,429,411 | 106 | 1,278,595 | 43 | 686,890 | 268 |
| MICHIGAN | 2,466,819 | 113 | 523,671 | 10 | 27,285 | 6 |
| MINNESOTA | 2,680,550 | 602 | 253,599 | 19 | 58,275 | 28 |
| OHIO | 4,732,863 | 260 | 2,876,911 | 82 | 53,695 | 26 |
| WISCONSIN | 2,143,536 | 240 | 570,744 | 26 | 36,496 | 53 |
| REGION VI | 7,905,778 | 318 | 3,838,728 | 252 | 642,748 | 102 |
| ARKANSAS | 679,598 | 71 | 493,350 | 91 | 7,514 | 6 |
| LOUISIANA | 1,747,024 | 52 | 0 | 0 | 0 | 0 |
| NEW MEXICO | 397,000 | 3 | 4,500 | 1 | 138,724 | 45 |
| OKLAHOMA | 178,503 | 29 | 1,071,569 | 108 | 217,457 | 21 |
| TEXAS | 4,903,653 | 163 | 2,269,309 | 52 | 278,783 | 30 |
| REGION VII | 4,724,721 | 380 | 1,325,930 | 146 | 314,641 | 123 |
| IOWA | 1,281,814 | 264 | 370,044 | 22 | 18,481 | 9 |
| KANSAS | 380,390 | 31 | 624,961 | 72 | 30,273 | 4 |
| MISSOURI | 2,371,099 | 47 | 299,184 | 48 | 261,808 | 108 |
| NEBRASKA | 691,418 | 38 | 31,741 | 4 | 4,079 | 2 |

Note: Chemical used was not indicated for all systems, so these data are not consistent with other summary tables.

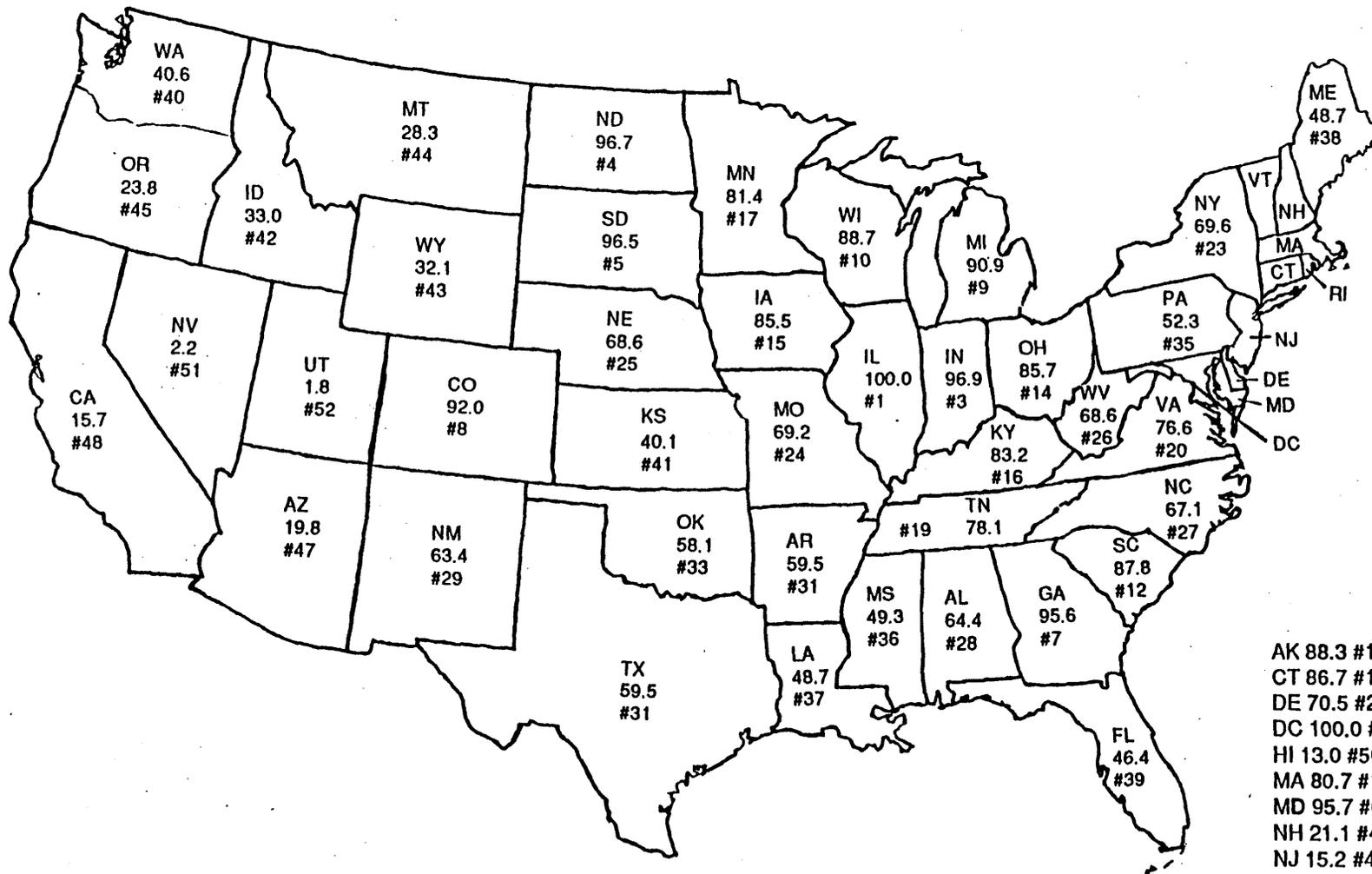
TABLE VI (CONTINUED)
NUMBER OF PUBLIC WATER SUPPLY SYSTEMS AND POPULATION SERVED BY EACH
OF THE MAJOR CHEMICALS BY REGION AS OF DECEMBER 31, 1988

| | HYDROFLUOSILICIC ACID | | SODIUM SILICOFLUORIDE | | SODIUM FLUORIDE | |
|----------------------|--------------------------|--------------|--------------------------|--------------|--------------------|--------------|
| | POPULATION | #SYSTEMS | POPULATION | #SYSTEMS | POPULATION | #SYSTEMS |
| UNITED STATES | 69,090,692 | 4,653 | 33,679,408 | 1,329 | 10,500,735 | 2,121 |
| REGION VIII | 421,045 | 180 | 2,903,442 | 160 | 275,379 | 155 |
| COLORADO | 86,243 | 3 | 2,281,425 | 112 | 87,214 | 23 |
| MONTANA | 0 | 0 | 40,100 | 4 | 19,760 | 19 |
| NORTH DAKOTA | 112,502 | 62 | 302,026 | 17 | 56,122 | 42 |
| SOUTH DAKOTA | 207,749 | 112 | 172,086 | 20 | 106,380 | 66 |
| UTAH | 3,004 | 2 | 15,596 | 1 | 4,830 | 4 |
| WYOMING | 11,547 | 1 | 92,209 | 6 | 1,073 | 1 |
| REGION IX | 12,973 | 2 | 135,000 | 1 | 184,452 | 87 |
| ARIZONA | 12,000 | 1 | 135,000 | 1 | 56,983 | 64 |
| CALIFORNIA | 973 | 1 | 0 | 0 | 4,070 | 6 |
| HAWAII | 0 | 0 | 0 | 0 | 121,470 | 7 |
| NEVADA | 0 | 0 | 0 | 0 | 1,929 | 10 |
| REGION X | 1,099,755 | 42 | 741,616 | 50 | 418,623 | 150 |
| ALASKA | 0 | 0 | 0 | 0 | 257,639 | 125 |
| IDAHO | 0 | 0 | 48,092 | 6 | 0 | 0 |
| OREGON | 20,000 | 1 | 429,870 | 26 | 14,425 | 5 |
| WASHINGTON | 1,079,755 | 41 | 263,654 | 18 | 146,559 | 20 |

Note: Chemical used was not indicated for all systems, so these data are not consistent with other summary tables.

Chart 1

PERCENT OF PUBLIC WATER SUPPLY POPULATION USING FLUORIDATED WATER AND STATE RANKING



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